



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/586,117

08/16/2006

Douglas H. Werner

PST-16902/36

1698

25006

7590

06/12/2009

GIFFORD, KRASS, SPRINKLE, ANDERSON & CITKOWSKI, P.C

PO BOX 7021

TROY, MI 48007-7021

EXAMINER

CHEN, SHIH CHAO

ART UNIT

PAPER NUMBER

2821

MAIL DATE

DELIVERY MODE

06/12/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/586,117	Applicant(s) WERNER ET AL.	
	Examiner Shih-Chao Chen	Art Unit 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 July 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/28/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 12/28/2006 has been considered by the examiner.
2. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 170, 176. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 176, 180. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the electromagnetic absorber, electromagnetic reflector, electromagnetic transmitter, or antenna must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

Art Unit: 2821

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

6. Claim 22 is objected to because of the following informalities: in line 2, "each unit cell" should be changed to --the unit cell--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 7, 21, and 39-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Claim 7 recites the limitation "the conducting polymer" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

10. Claim 21 recites the limitation "the remote source of electromagnetic radiation" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Art Unit: 2821

11. Claims 39 and 40 recite the limitation "the external condition" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1-4, 6-29 and 32-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Werner et al. (US 2004/0263420 A1).

Regarding claim 1, Werner et al. teaches in figures 1-7 a frequency selective surface (FSS) [10, 70] comprising a periodically replicated unit cell [100], the unit cell including a chemoresistive material (See paragraph [0056]) having an electrical conductivity that changes in a presence of an analyte.

Regarding claim 2, Werner et al. teaches in figures 1-7 the FSS of claim 1, wherein the unit cell [100] further comprises: an arrangement of conducting patches [12] on a dielectric substrate [16].

Regarding claim 3, Werner et al. teaches in figures 1-7 the FSS of claim 2, wherein at least two conducting patches [12] are interconnected by the chemoresistive material.

Regarding claim 4, Werner et al. teaches in figures 1-7 the FSS of claim 1, wherein the unit cell [100] comprises a pattern of chemoresistive material on a dielectric substrate [16].

Regarding claim 6, Werner et al. teaches in figures 1-7 the FSS of claim 1, wherein the chemoresistive material comprises a conducting polymer (See paragraph [0056]).

Regarding claim 7, Werner et al. teaches in figures 1-7 the FSS of claim 1, wherein the electrical conductivity of the conducting polymer decreases when the conducting polymer is exposed to the analyte.

Regarding claim 8, Werner et al. teaches in figures 1-7 the FSS of claim 1, wherein the chemoresistive material includes a semiconductor nanostructure (See paragraph [0056]).

Regarding claim 9, Werner et al. teaches in figures 1-7 the FSS of claim 1, wherein the chemoresistive material includes a metal nanostructure (See paragraph [0056]).

Regarding claim 10, Werner et al. teaches in figures 1-7 the FSS of claim 1, wherein the chemoresistive material includes a composite of a polymer and electrically conducting particles (See paragraph [0056]).

Regarding claim 11, Werner et al. teaches in figures 1-7 the FSS of claim 10, wherein the conducting particles are carbon-containing particles (See paragraph [0056]).

Regarding claim 12, Werner et al. teaches in figures 1-7 the FSS of claim 10, wherein the polymer swells on exposure to the analyte.

Regarding claim 13, Werner et al. teaches in figures 1-7 an artificial magnetic conductor [10] comprising the FSS of claim 1, the FSS being supported by a surface of

Art Unit: 2821

a thin dielectric substrate [16], the opposed surface of the dielectric layer supporting an electrical conductor [18].

Regarding claim 14, Werner et al. teaches in figures 1-7 an electromagnetic absorber (See paragraph [0091] including the FSS of claim 1.

Regarding claim 15, Werner et al. teaches in figures 1-7 an antenna (See paragraph [0094]) including the FSS of claim 1.

Regarding claim 16, Werner et al. teaches in figures 1-7 an electromagnetic reflector (See paragraph [0092]) including the FSS of claim 1.

Regarding claim 25, Werner et al. teaches in figures 1-7 a frequency selective surface (FSS), the FSS [10, 70] comprising a periodically replicated unit cell [100], the unit cell including a chemoresistive material (See paragraph [0056]) having an electrical conductivity that changes in a presence of an analyte.

Regarding claim 26, Werner et al. teaches in figures 1-7 the FSS of claim 25, wherein the unit cell [100] has a geometry chosen so as to provide an electromagnetic resonance at a resonance frequency (See paragraph [0048]).

Regarding claim 27, Werner et al. teaches in figures 1-7 the FSS of claim 25, wherein the unit cell [100] comprises an electrically conducting patch [72-78] and a region of chemoresistive material adjacent to the electrically conducting patch (See paragraph [0080]).

Regarding claim 28, Werner et al. teaches in figures 1-7 the FSS of claim 25, wherein the unit cell [100] comprises a plurality of electrically conducting patches [72-78], and at least one region of chemoresistive material (See paragraph [0080]).

Regarding claim 29, Werner et al. teaches in figures 1-7 the FSS of claim 25, wherein the unit cell [100] comprises a first chemoresistive material [86] having a first electrical conductivity correlated with a presence of a first analyte, and a second chemoresistive material [94] having an electrical conductivity correlated with a presence of a second analyte (See paragraph [0049-0053]).

Regarding claim 32, Werner et al. teaches in figures 1-7 an apparatus comprising a periodic structure [70], the periodic structure including a pattern of chemoresistive material (See paragraph [0056]), the apparatus having a first electromagnetic property [86] in a presence of an analyte, and a second electromagnetic property [94] in an absence of the analyte, a difference between the first electromagnetic property and the second electromagnetic property at least in part arising from an electrical conductivity change of the chemoresistive material (See paragraph [0049-0053]).

Regarding claim 33, Werner et al. teaches in figures 1-7 the apparatus of claim 32, wherein the periodic structure [70] is a frequency selective surface supported on a surface of a dielectric layer [16].

Regarding claim 34, Werner et al. teaches in figures 1-7 the apparatus of 32, wherein the periodic structure [70] further comprises a replicated pattern of metal patches [72-78].

Regarding claim 35, Werner et al. teaches in figures 1-7 the apparatus of claim 32, wherein the apparatus is an electromagnetic absorber, electromagnetic reflector, electromagnetic transmitter, or antenna (See paragraph [0091-0092] & [0094]).

Regarding claim 36, Werner et al. teaches in figures 1-7 an apparatus including a frequency selective surface (FSS), the FSS [70] comprising a pattern of conductive patches [72-78], the conducting patches being selectively interconnectable by a matrix of independently addressable switches [86, 94, 88].

Regarding claim 37, Werner et al. teaches in figures 1-7 the apparatus of claim 36, wherein the switches [86, 94, 88] are passive switches not in electrical communication with a voltage source.

Regarding claim 38, Werner et al. teaches in figures 1-7 the apparatus of claim 37, wherein the switches [86, 94, 88] are responsive to an external condition, the switches having a first electrical conductivity in a presence of the external condition, and a second electrical conductivity in an absence of the external condition.

Regarding claim 39, Werner et al. teaches in figures 1-7 the apparatus of claim 37, wherein the external condition is a presence of an analyte, the switches [86, 94, 88] having the first electrical conductivity in a presence of the analyte, and the second electrical conductivity in an absence of the analyte.

Regarding claim 40, Werner et al. teaches in figures 1-7 the apparatus of claim 37, wherein the external condition is incident electromagnetic radiation (See paragraph [0050-0051]).

Regarding claim 41, Werner et al. teaches in figures 1-7 the apparatus of claim 36, comprising a plurality of switch types (See paragraph [0049]), each switch type responsive to a different external condition.

Art Unit: 2821

Regarding claim 42, Werner et al. teaches in figures 1-7 the apparatus of claim 41, wherein each switch type (See paragraph [0049]) is responsive to a different analyte (See paragraph [0050-0052]).

Regarding claim 43, Werner et al. teaches in figures 1-7 an apparatus substantially as described herein.

Regarding process claims 17-24 and 44, the apparatus discussed above would perform the claimed method.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 5 and 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Werner et al. (Cited above) in view of Eggleston et al. (U.S. Patent No. 6,054,954).

Werner et al. teaches every feature of the claimed invention in paragraph 13 except for at least one dielectric slot in a conducting medium; and at least on dipole slot formed in a metal screen.

Eggleston et al. teaches in figure 6, at least one dielectric slot [630, 632] in a conducting medium [618, 620]; and at least on dipole slot [630, 632] formed in a metal screen [618, 620].

in view of the above statement, it would have been obvious to one having ordinary skill in the art at the time the invention was made by using slots & patch-tab sections as

Art Unit: 2821

taught by Eggleston et al. in order to provide a slot dipole antenna (See col. 5, lines 23-35).

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-Chao Chen whose telephone number is (571) 272-1819. The examiner can normally be reached on Monday-Thursday from 7 AM to 5:30 PM, Fri. off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Shih-Chao Chen
Primary Examiner
Art Unit 2821

Application/Control Number: 10/586,117
Art Unit: 2821

Page 12

SXC
June 10, 2009
/Shih-Chao Chen/
Primary Examiner, Art Unit 2821